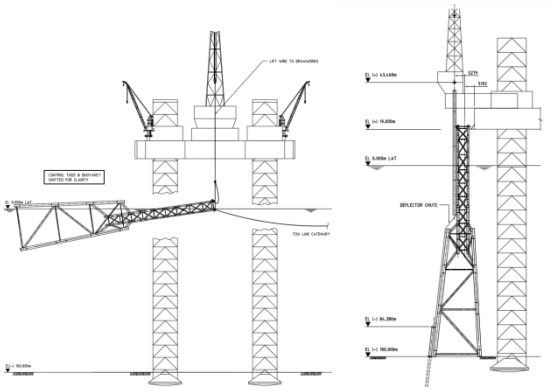
WOODSIDE ENERGY LTD, OTWAY FIELD DEVELOPMENT
THYLACINE WELLHEAD PLATFORM

Concept and FEED Engineering, Otway Basin

ICON Engineering Pty Ltd (ICON) was engaged by Woodside Energy Ltd to conduct Concept and FEED Engineering for the Thylacine Wellhead Platform.

Various methods for installing the Otway Basin Thylacine wellhead platform in harsh environment 100m water depth (100 year Hmax = 24m, with Tp = 16 sec) were reviewed and screened. A gravity base structure option was also considered. A base case installation method was adopted. This involved a rig installed single piece jacket that was to be fabricated, loaded out and transported horizontally to the field. The jacket was buoyant, and was to be offloaded at a sheltered location into the ocean, near the installation site. It was to be towed to the rig, and upended and placed with the assistance of buoyancy tanks.

The piles were designed to be drilled and grouted, due to the geotechnical conditions. Drilling was to be completed using reverse circulation. Pile segments were designed to be made up and installed though the derrick and piles run through the jacket legs. The topsides was designed to be installed by the reach over method. The jacket installation details were as illustrated below.



The most significant cost reduction with the rig-installed method was the elimination of the heavy lift crane barge from the project. The number of lifts was kept to a minimum and the drilled and grouted pile engineering was studied in detail.

The risk weighted cost ranking for the installation options was found to be as follows (From best to worst):

- Option A – Single piece jacket; Wet tow & floating upend
- Option B – Two piece jacket; Wet tow & floating upend of base; Dry lift upper jacket
- Option C – Two piece jacket; Dry lift & buoyant upend of base; Dry lift upper jacket
- Option D - Single piece jacket; Dry lift & buoyant upend

Option A: jack-up rig install was adopted as the base case for the project. Only one marine lift for the jacket on rig critical path time was required. The lift hook load was well within the capability of all of the rigs under consideration for that water depth and environment.

The topsides was designed to suit the reach over method.

The EPIC phase of the project was awarded to a Tier 1 contractor and ICON worked for Woodside during the installation. ICON had proposed in the FEED that the jacket be designed for float off by a transport ship. Instead, the contractor elected to launch the jacket from a cargo barge, which resulted in significant weight changes. The need for launch rails on the jacket resulted in a redesign of the jacket and substantial increase in the weight of the jacket and buoyancy required.

Photographs of the jacket and deck installation are provided below.

The Thylacine Platform was the deepest water depth jacket installation completed using a jack up rig, to date.

Platform Data

Water depth	100 m
Jacket Weight	1,400 t
Topsides Weight	550 t
Legs/Wells	3 legs/ 6 wells

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